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REMARKS

The application has been reviewed in light of the final Office Action dated July 20, 2006. Claims 1-18 are pending, with 5-18 having been withdrawn by the Patent Office from examination. By this Amendment, claims 1 and 3 have been amended to place the claim in better form for examination and to clarify the claimed invention. It is submitted that no new matter and no new issues have been introduced by the present amendment. Support for the claim amendment can be found in, for example, Figures 1 through 2B (and corresponding discussion in the specification) of this application. Therefore, entry of this amendment is requested. Accordingly, claims 1-4 are presented for reconsideration, with claim 1 being in independent form.

Claims 1-4 were rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite.

By this Amendment, claim 1 has been amended to place the claim in better form for examination and to clarify the claimed invention, without narrowing a scope of the claimed invention.

Withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

Claims 1, 2 and 4 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over U.S. Patent No. 5,318,653 to Toide et al. in view of Holmes (US 2004/0111913 A1) or Komaki et al. (US 2004/0246884 A1). Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Toide, Holmes and Komaki and in further view of U.S. Patent No. 6,596,104 to Tomiyama.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claim 1 is patentable over the cited art, for at least the

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following reasons.

This application relates to adhering parts to a target with light energy curable adhesive. When light energy is applied to light energy curable adhesive to adhere parts to a target, there is often the problem that the light energy curable adhesive shrinks when cured with light. Such curing shrinkage generates stress (from curing shrinkage force) which causes lateral displacement relatively between a part and a target. Such lateral displacement from curing shrinkage force presents an obstacle to precise assembly of the part to the target.

Applicant devised an improved approach for adhering parts to a target with light energy curable adhesive which includes adjusting irradiation energy to offset stresses generated by the curing shrinkage forces and thereby minimize (or overcome) such lateral displacement. For example, independent claim 1 is directed to a method for adhering parts to a target with light energy curable adhesive and addresses these features, as well as additional features.

Todie, as understood by Applicant, proposes a method for manufacturing optical discs which includes laminating two disc substrates with adhesive. The first and the second disc substrates are held with relative inclination and the adhesive is sandwiched therebetween. The inclination is gradually decreased and the discs are positioned to have a prescribed angle so that any bubble can be eliminated from the adhesive, and then the adhesive is cured.

Todie, as acknowledged in the Office Action, does not teach or suggest, however, changing irradiation energy such that at least one portion of at least one of the light energy curable adhesives experiences a change in irradiation energy when the part and the target are relatively displaced from each other in the course of shrinkage of the at least one of the light energy curable adhesives so that at least one of the curing shrinkage forces can be changed and stresses generated by the curing shrinkage forces can be offset, as provided by the subject matter

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of claim 1 of the present application.

Holmes, as understood by Applicant, proposes an electromagnetic energy spot curing system which can be used for curing an adhesive, wherein a light emission intensity is changed by using a template that moves relatively in relation to an ultraviolet lamp. The template includes several holes having increasing diameters in an arch state at a prescribed position distanced from a rotational axis, thereby linearly adjusting an intensity of energy applied to curable resin or the like by controlling a rotational angle of the template. Holmes teaches that it may be desirable in some instances to change the UV energy intensity in order to achieve different final polymer properties in the bonding agent.

Komaki, as understood by Applicant, proposes an approach for optical disc manufacturing, wherein light emission is executed plural times with different intensities, so as to suppress deformation when a light energy curable type resin layer receives emission of an energy light and is cured.

As implicitly acknowledged in the Office Action, Holmes and Komaki, like Todie, does not teach or suggest, however, changing irradiation energy such that at least one portion of at least one of the light energy curable adhesives experiences a change in irradiation energy when the part and the target are relatively displaced from each other in the course of shrinkage of the at least one of the light energy curable adhesives so that at least one of the curing shrinkage forces can be changed and stresses generated by the curing shrinkage forces can be offset, as provided by the subject matter of claim 1 of the present application.

Komaki proposes applying a series of plural light emissions with predetermined, different intensities. However, Komaki simply does not disclose or suggest means for detecting lateral displacement between the part and the target relatively during curing of the light energy curable

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adhesive, and changing the irradiation energy so that the relative position of the part and the adhering target can be adjusted.

Tomiyama, as understood by Applicant, proposes an approach for bonding two or more optical disc substrates, wherein adhesive is applied between the two disc substrates to form a bonding layer, a thickness of the bonding layer is measured with a thickness gauge, a rotation device for rotating a disc when the adhesive is controlled based on the measurement. In addition, a pressure applying mechanism may be provide to apply pressure to the substrates during bonding, and the pressure can be controlled based on the measurement.

Accordingly, while Tomiyama proposes methods for controlling the thickness of the bonding layer, Tomiyama, like the other cited references, fails to disclose or suggest means for detecting lateral displacement between the part and the target relatively during curing of the light energy curable adhesive, and changing the irradiation energy so that the relative position of the part and the adhering target can be adjusted. Tomiyama simply does not express a concern for displacement between the part and the target to be bonded.

Applicant does not find teaching or suggestion in the cited art, however, of changing irradiation energy such that at least one portion of at least one of the light energy curable adhesives experiences a change in irradiation energy when the part and the target are relatively displaced from each other in the course of shrinkage of the at least one of the light energy curable adhesives so that at least one of the curing shrinkage forces can be changed and stresses generated by the curing shrinkage forces can be offset, as provided by the subject matter of claim 1 of the present application.

Accordingly, for at least the above-stated reasons, Applicant respectfully submits that independent claim 1 and the claims depending therefrom are patentable over the cited art.

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In view of the amendments to the claims and remarks hereinabove, Applicant submits that the application is now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any fees that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,

  
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